REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

The claims have been amended to further recite an apparatus for estimating the output characteristic of the fuel cell after the output has undergone a change 'due to ageing degradation of the fuel cell" over time. Basis for this is found in paragraphs [0004] ("owing to a change in the output characteristic of the fuel cell as it has been used for an extended period of time") and [0006] ("the output characteristic ... is likely to change as the fuel cell has been used for an extended period of time"). That is, the actual output of a fuel cell may be less than a nominal output due to a loss of performance over an extended period of use. The actual output of the fuel cell may therefore be unable to satisfy a rated load, and must be independently determined.

Applicants wish to thank Examiner Martin for the courtesy of an interview on December 12, 2006, at which time amendments according to the present response were discussed in conjunction with the expert declaration of Mr. Kouta Manabe under 37 C.F.R. 1.132. According to the Manabe declaration, one skilled in the art of fuel cells would understand from the disclosure of the present application, particularly at paragraphs [0004] and [0006] thereof, that the description of a change in the output characteristic of the fuel cell used for an extended period of time refers to the reduction in the actual power output, as compared to a nominal power output, due to ageing degradation of the fuel cell components over several hundred hours, or more, of use. Mr. Manabe also explains that one skilled in the art of fuel cells would understand that estimating "the output characteristic of the fuel cell after the output characteristic of the fuel cell has undergone a change due to aging degradation of the fuel cell over time" means estimating the reduction in the actual power output, as compared to the nominal power output, due to ageing degradation of the fuel cell components over several hundred hours, or more, of use. No agreement was reached at that time, pending the

Examiner's further consideration of the Manabe declaration following the filing of a written response. However, in response to the Examiner's concerns during the interview, the present response further explains the basis for the present amendment.

The description of paragraphs [0004] and [0006] provides basis for the present amendment because the language of the amendment merely rephrases the description of these paragraphs in a manner consistent with the understanding of one skilled in the art. The specification is written from the standpoint of one skilled in the art. See 35 U.S.C. 112, first paragraph. Thus it is not new matter to rephrase a portion of the original description as it would have been understood by one skilled in the art. MPEP § 2163.07(I). Paragraph 4 of the Manabe declaration provides evidence that one skilled in the art of fuel cells would understand that the description of a change in the output characteristic of a fuel cell used for an extended period of time means the reduction in power output due to ageing degradation of the fuel cell components over several hundred hours of use. Accordingly, the recitation of "due to ageing degradation of the fuel cell" in the present amendment is merely a rephrasing of the description of paragraphs [0004] and [0006] corresponding to the understanding of one skilled in the art and does not comprise new matter.

Claims 1-13 were rejected under 35 U.S.C. 112 because the phrase "undergone a change over time" was considered to be indefinite. As noted above, this has been amended to "undergone a change due to ageing degradation of the fuel cell over time." Evidence that the scope of this limitation would be understood by those skilled in the art is provided by the Manabe declaration which states that one skilled in the art of fuel cells would understand from the disclosure of the present application, particularly at paragraphs [0004] and [0006] thereof, that the description of a change in the output characteristic of the fuel cell used for an extended period of time means the reduction in the actual power output, as compared to a nominal power

output, due to ageing degradation of the fuel cell components over several hundred hours, or more, of use, and that one skilled in the art of fuel cells would understand that estimating "the output characteristic of the fuel cell after the output characteristic of the fuel cell has undergone a change due to aging degradation of the fuel cell over time" means estimating the reduction in the actual power output, as compared to the nominal power output, due to ageing degradation of the fuel cell components over several hundred hours, or more, of use. Thus the claims would be understood by one skilled in the art, and so the rejection under 35 U.S.C. 112 is believed to be moot.

Claims 1-3, 7-9, 11-13 and 40 were again rejected under 35 U.S.C. 102 as being anticipated by Hirashima. Claims 4-6, 10 and 41 were rejected under 35 U.S.C. 103 as being obvious over Hirashima. As Applicants explained during the interview, Harashima is concerned only with changes to the output characteristic for transient load changes. That is, due to the possibility of an overload of the fuel cell between the time that an increased output is commanded and a time that the fuel cell temperature reaches a stable value (col. 2, lines 18-31), Harashima adds an extra amount "q" to the reference fuel flow rate (Fig. 4) to compensate for the voltage drop due to a low fuel cell temperature until the fuel cell temperature has reached a steady state operating temperature (col. 7, lines 8-39). Thus any estimation of a change in the output of the fuel cell over time in Harashima relates to short term transient changes in response to changing load requirements. This may be contrasted with the claimed invention in which the output characteristic of a fuel cell, which has changed due to ageing degradation of the fuel cell over time, is estimated.

The Manabe declaration is believed to provide evidence that the plain meaning of "a change due to aging degradation of the fuel cell over time" as understood by one skilled in the art does not correspond to the teachings of Harashima. MPEP § 2111.01. The Manabe declaration explains that one skilled in the art would understand that estimating "the output

characteristic of the fuel cell after the output characteristic of the fuel cell has undergone a change due to aging degradation of the fuel cell over time" means estimating the reduction in the actual power output, as compared to the nominal power output, due to ageing degradation of the fuel cell components over several hundred hours, or more, of use. It also explains that one skilled in the art would not understand "the output characteristic has undergone a change due to aging degradation of the fuel cell over time" to mean a change in power output due to changes in fuel supply pressure or fuel cell temperature, because this change in power output is not due to ageing degradation of the fuel cell components. Thus the plain meaning of "a change due to aging degradation of the fuel cell over time" cannot include changes in the output characteristic over a brief time period due to changes in fuel supply pressure or fuel cell temperature, as in Harashima.

It is therefore evident that the claims define over Harashima. Claims 1-13 recite a controller that estimates the output characteristic of the fuel cell after the output characteristic has undergone a change due to ageing degradation of the fuel cell over time on the basis of the detected output current and the detected voltage between the terminals, detected by the current-voltage detector, and a predetermined basic output characteristic of the fuel cell. The change in output taught in Harashima is not a change in output due to aging degradation of the fuel cell over time, but a change due to changes in fuel supply pressure or fuel cell temperature. Harashima therefore could not anticipate these claims or render them obvious to one skilled in the art.

Claims 40-41 similarly recite a controller that estimates the output characteristic of the fuel cell after the output characteristic has undergone a change due to ageing degradation of the fuel cell over time on the basis of the detected output current and the detected voltage between the terminals, detected by the current-voltage detector, and a predetermined basic output characteristic of the fuel cell, wherein the predetermined basic output characteristic is a

function of an internal resistance of the fuel cell. Here again, the disclosure in Harashima of changes in output due to changes in fuel supply pressure or fuel cell temperature are not changes due to aging degradation of the fuel cell over time, and could not anticipate these claims or render them obvious to one skilled in the art.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early notice of allowability.

Respectfully submitted,

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